# VBA: Tutorial Week 4

- Non-linear, non-sequential programming using loops
- Nesting: branches and loops
- Collaboration vs. misconduct

Official resource for MS-Office products: https://support.office.com

## First Tutorial (Monday or Tuesday):

## Open Tutorial

- No new teaching will occur but the TA will be available for help.
- During this "Open Tutorial" any CPSC 203 student can ask for help and not just the students who are registered in a particular tutorial.
- The purpose is to provide extra help because the next workbook exercise is the first one in which you need to write a program from scratch.

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## Second Tutorial (Wednesday or Thursday):

## Microsoft Introduction/Overview Of VBA

- https://docs.microsoft.com/en-us/office/vba/library-reference/concepts/getting-started-with-vba-in-office

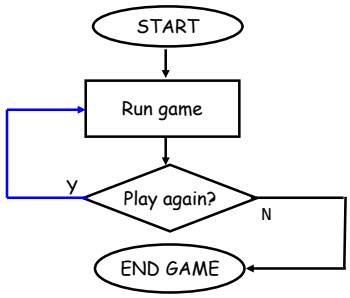


## Activities In Tutorial

- TA demos:
  - Used for more complex features (typically multiple steps are required).
  - The tutorial instructor will show on the projector/instructor computer each step for running the feature in Excel.
  - Unless otherwise specified the tutorial material will take the form of a TA demonstrating the use of features in Excel.
  - Slides titled "Lecture Review" are covered for the second time and dealing with less complex material.
    - For this reason they will only be covered briefly in tutorial.
- Student exercises:
  - Used instead of TA demos for simpler features.
  - You will have already been given a summary of how to invoke the feature and the purpose of the exercise is to give you a chance to try it out and get help if needed.

## Looping/Repetition

- Used when a part (or the entire) program needs to repeat as long a condition has been met.




```
Do while
(Condition)
    Instruction(s)
Loop
```

- The condition is a Boolean expression.



## Example: Counting Program (Up/Increases)

- **Name of the document containing example**: 4loopV1Up
- Features:
  - The program will iterate (count) through the sequence of numbers 1 – 11 in increments of 2 (1, 3, 5, 7, 9, 11)

```
Sub countingLoopV1Up()
    Dim i As Long
    i = 1
    Do While (i <= 11)
        MsgBox ("i=" & i)
        i = i + 2
    Loop
End Sub
```

  - Student exercise: what if the Boolean expression was changed to `(i <= 10)`?

## Example: Counting Program (Down/Decreases)

- **Name of the document containing example**: `5countingloopV2Down`
- Features:
  - The program will iterate (count) through the sequence of numbers 10 – 1 in decrements of 3 (10, 7, 4, 1)

```
Sub nineLoopV2()
   Dim i As Long
   i = 10
   Do While (i >= 1)
       MsgBox ("i=" & i)
       i = i - 3
   Loop
End Sub
```

  - Student exercise: what if the Boolean expression was changed to `(i >= 0)`?

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## Student Exercise

- Write a program that will, using a loop, display all the multiples of 5 in the range from 5 – 15,625.
- The program will display each multiple of 5 within this range in a `MsgBox` one-at-a-time.
- **Document containing the solution**: `2multiples_of_five_solution`

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# Nesting: Branches And Loop

- Branches and loops can be nested within each other

**Scenario 1**

```
If (Boolean) then
    If (Boolean) then
        ...
    End if
End if
```

**Scenario 2**

```
Do while (Boolean)
   If (Boolean) then
       ...
   End if
Loop
```

**Scenario 3**

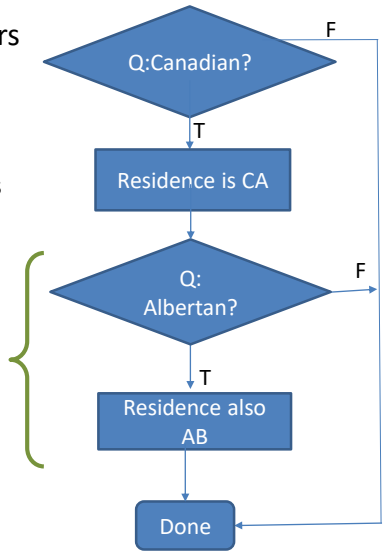
```
If (Boolean) then
    Do while (Boolean)
        ...
    Loop
End if
```



# Recognizing When **Nesting** Is Needed

- **Scenario 1**: Only if a question answers true then check if another question answers true or false.
  - Example: If the user entered Canada as country of residence then ask if the user's province of residence is Alberta.
  - Type of nesting: a IF-branch nested inside of an IF-branch

```
If (Boolean) then
    If (Boolean)
        ...
    End If
End If
```



## (Key Part: IF) Nested Inside An IF

- Nesting: a structure (e.g. IF) is nested inside of another structure (e.g. IF) when the second structure is part of the body of the first structure.
- **Word document containing the example**: 6nesting_branch_within_branch

```
'Some parts excluded for brevity.
country = InputBox("Current country of residence: ")
If (country = "Canada") Then
    message = message & "Great country, "
    province = InputBox("Current province of residence: ")
    If (province = "AB") Then
        message = message & " Greatest place on earth ^-*"
    End If 'Checking province
End If 'Checking country
```

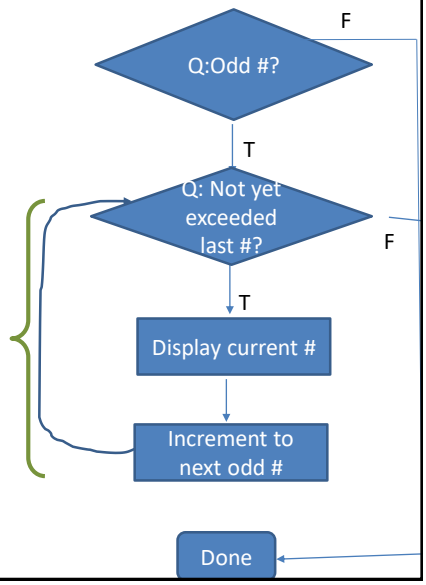
- Recall: the check for the Boolean expression for the second IF does not occur unless the first Boolean expression is true. (Don't bother checking if province is AB if country isn't Canada).



## Recognizing When Nesting Is Needed

- **Scenario 2**: If a question answers true then check if a process should be repeated.
  - Example: If the user entered an odd number then count through a sequence 1 to this number and display each odd number in this sequence.
  - Type of nesting: a Do-While loop nested inside of an IF-branch

```
If (Boolean) then
    Do While (Boolean)
        ...
    Loop
End If
```



## (Key Part: Do-While) Nested Inside An IF

- **Word document containing the example**: 7nesting_loop_in_branch

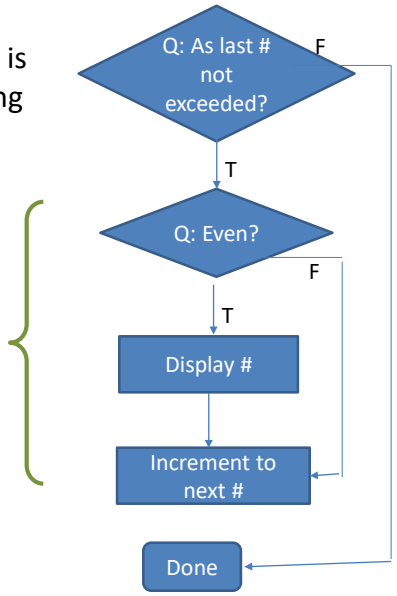
```
'Variable & constant declaration excluded for brevity
lastOdd = InputBox("Enter last odd number in sequence: ")
remainder = lastOdd Mod 2
If (remainder = 0) Then
    MsgBox (lastOdd & " is even not odd.")
Else
    If (lastOdd <= MAX_ODD) Then
        count = 1
        Do While (count <= lastOdd)
            MsgBox ("Current number = " & count)
            count = count + 2
        Loop
    End If 'End: checks size of last #
End If 'End: checks if # is odd or even
```



## Recognizing When Nesting Is Needed

- **Scenario 3**: As long some condition is met a question will be asked. As long as some condition is met a popup will be displayed.
  - Example: While the last number in a sequence hasn't been exceeded if the current number is even it will be displayed.
  - Type of nesting: an IF-branch nested inside of a Do-While loop

```
Do While (Boolean)
    If (Boolean) then
        ...
    End If
Loop
```



## (Key Part: IF Nested) Inside A Do-While

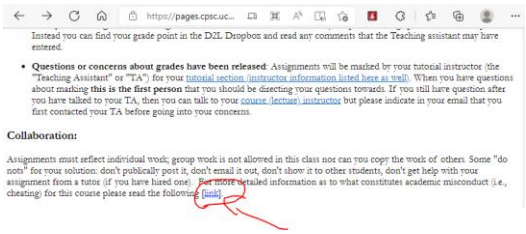
- **Word document containing the example**: 8nesting_branch_in_loop

```
Const MAX_NUMBER As Long = 20
Dim lastNumber As Long
Dim count As Long
Dim remainder As Long
lastNumber = InputBox("Enter last number in a sequence: ")
If (lastNumber <= MAX_NUMBER) Then
    count = 1
    Do While (count <= lastNumber)
       remainder = count Mod 2
       If (remainder = 0) Then
           MsgBox ("Current  even #: " & count)
       End If
       count = count + 1
   Loop
End If
```



## Collaboration Vs. Misconduct

- There's a link to additional details in every assignment and exercise description.


Instead you can find your grade point in the D2L Dropbox and read any comments that the Teaching assistant may have entered.

- **Questions or concerns about grades have been released**: Assignments will be marked by your tutorial instructor (the "Teaching Assistant" or "TA") for your tutorial section (instructor information listed here as well). When you have questions about marking **this is the first person** that you should be directing your questions towards. If you still have question after you have talked to your TA, then you can talk to your course (lecture) instructor but please indicate in your email that you first contacted your TA before going into your concerns.

**Collaboration:**

Assignments must reflect individual work; group work is not allowed in this class nor can you copy the work of others. Some "do nots" for your solution: don't publically post it, don't email it out, don't show it to other students, don't get help with your assignment from a tutor (if you have hired one). For more detailed information as to what constitutes academic misconduct (i.e., cheating) for this course please read the following [link]

- Web address:
  - https://pages.cpsc.ucalgary.ca/~tamj/2022/203W/assignments/misconduct.html

## Avoiding Misconduct

- Some "do nots" for your solution: don't publically post it, don't email it out, don't show it to other students, don't get help with your assignment from a tutor (if you have hired one).
- You cannot copy the work of other students nor can students work in groups. To avoid potential cases of misconduct students should not show or otherwise provide their assignment solutions to their classmates.

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## What Is Academic Misconduct?

- Cheating has occurred if you hand in someone else's work as if it were your own *(without crediting* the other person).
- If a student knowingly provides his or her graded work to another student then both students are guilty of academic misconduct (the first student helped the second student to cheat).

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## What Happens If I Cite My Sources

- You are required to cite all sources including lecture and tutorial notes (if applicable). If you don't cite the source then you have made the strong implication that this work is yours when it isn't so you will be guilty of academic misconduct.
- What happens if you include someone else's work and *you do* credit the other person properly (this doesn't apply to your classmates, recall that you are not to see the assignment work of other students).
- This won't count as cheating but since someone else did the work for that section of your assignment you won't get credit for that part of the assignment (you can get credit if you use code from tutorial or lecture if it's cited, where you won't get credit is other sources such as the web or a book).
  - You could get marks for the other parts of the assignment.
  - The crediting of other's people work must be very specific and clear because your marker needs to be able to unambiguously determine which parts of your assignment did you complete and which parts came from an outside source.

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## How To Cite Your Sources

- The format of the citation isn't what's important.
- Instead you should focus on clearly communicating to your marker exactly what parts of your submission that you completed and what parts come from external sources.
  - If there is no citation then the assumption is that you are the sole source.
- One approach: use the "sandwich method"

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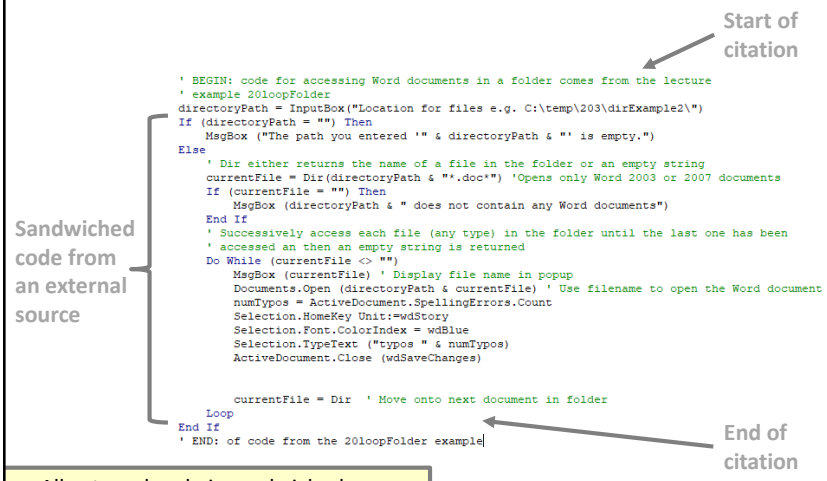
## Example Of Sandwiching Your Citation




- All external code is sandwiched.
- Any code outside of a sandwich is assumed to be written by the student (make sure this is ac

## What If You Hired A Tutor?

- Can I get help on an assignment from this person?
- Tutors can be useful helping to clarify concepts (e.g. what is 'loop' in programming) or showing you where to find features in Office or how they work. The problem with going over an assignment with a tutor is that the 'help' ends up with the tutor completing some or all of the assignment for you.
- This is similar to getting a solution from a class mate because you didn't do the work so it is likely that it will be ruled as academic misconduct.

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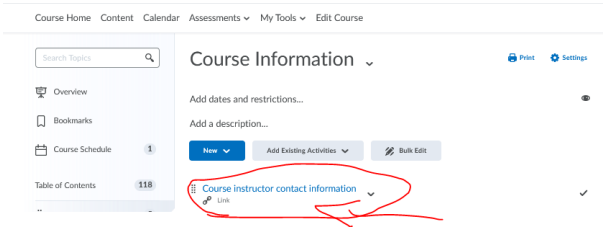
## What If We Have Questions About What's Allowed?

- Normally you can ask the Teaching Assistants questions.
- If you have questions about what's allowed and not allowed in terms of misconduct then you should ask the course instructor rather than the TA.
  - Link to the contact times/information for the course instructor in D2L:

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